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ABSTRACT

The effectiveness of three methods of physical education programing for improving the physical performance and reducing undesirable behavior of 96 emotionally disturbed boys (ages 8 to 14 years) was studied in an 8-week summer camp setting. Subjects were initially diagnosed and grouped by psychiatrists as aggressive, hyperactive, or withdrawn. Stratified randomization was then used to assign Ss to the treatments of physical fitness, general coordination, specific coordination, and control. Pretest and posttest data were collected in 3 motoric areas (strength, endurance, and coordination) and 15 affective areas (subscales of Devereux and Quay instruments). Covariance analysis indicated that while specific coordination procedures yielded superior performance on the motoric measures, little change in affective aspects was noted among the four treatments. (Author)

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THE COMPARATIVE MOTOR AND AFFECTIVE BENEFITS OF THREE PHYSICAL EDUCATION PROGRAMMING TECHNIQUES USED WITH EMOTIONALLY IMPAIRED CHILDREN

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After more than 100 studies on the effects of physical education training for children with some type of impairment, it appears that handicapped children benefit from "systematic" physical education when measured on various motor, cognitive, and affective variables (Mann, Burger, & Proger, in press). Just what the structured nature of systematic programs should be remains an unanswered question. Attempts to explain observed benefits in terms of educational, psychological, and medical theory have been limited owing in part to methodological and measurement problems in many of the relevant studies.

Reviews of previous studies of physical education used with disturbed children yield little relevant information (Goheen, 1969; Goodwin, 1970; Stein, 1966; Mann, Burger, & Proger, in press). Studies evaluating the usefulness of various types of physical education programming with the mentally retarded have been numerous, while those with other handicapped populations (especially the emotionally disturbed) have been notably lacking. Those studies including an emotionally disturbed group of children have produced conflicting results concerning the influence of physical education activities on (a) physical status and performance variables and (b) social and emotional variables.

Most investigations have examined the influence of physical training on physical status and performance variables. Haley (1970) studied the effects

of an individualized movement program on motor development, gross-motor skills, and psychosocial behavior. While small sample size and other problems limited the conclusions that could be drawn from this study, all subjects improved in gross-motor skills. Olson (1968) studied the effectiveness of a supplementary physical education program on motor skills with primary school-age children who had problems in achievement and behavior adjustment. While improvement favoring the experimental group over the control group was not evident, the experimental instruction group showed somewhat greater retention of the motor skills developed. A recent investigation by Beyer (1973) considered the effectiveness of a special physical education program on motor fitness, perceptual-motor ability, intellectual maturity, emotional maturity, and classroom behavior of emotionally disturbed children. Several intact classes were assigned to either a special physical education program, a regular physical education program, or a control program (sensory-motor training). The major finding was that the special physical education program was superior to the other programs in improving motor fitness and perceptual-motor functioning, while no differences between the programs were evidenced for the other variables.

A few of the reviewed studies also examined social and emotional variables to see if training regimes resulted in discernible improvement in behavioral or emotional adjustment. In comparing two types of physical education with a control group, Olson (1968) found no changes on a behavioral rating scale and concluded that the 6-week program did not influence these variables. Thorton and Lane (1968) hypothesized that physical education would help eliminate negative classroom behaviors. After a 6-week program, a behavior rating scale indicated no significant reduction in negative behaviors, while an observation checklist technique revealed a slight reduction. Haley (1970) used Cassel's Child Behavior Rating Scale and found improved social adjustment for some subjects, but the overall group effect was not strong.

Physical education programming appears to be of value with emotionally disturbed children for developing overall fitness and motor development. However, evidence of the effectiveness of these same programs in reducing behavioral problems and fostering better emotional adjustment has been lacking. The present study attempted to investigate the influence of three physical education programming techniques on both motor development and subsequent behavioral adjustment for a population of emotionally disturbed children.

PROCEDURE

From a total of 130 boys between the ages of 8 and 14, who were enrolled in special classes for the emotionally disturbed in Montgomery County (Pennsylvania) schools during the Spring of 1971, 96 Ss were selected to participate. The Ss had to be available to participate in a continuous 8-week summer camp program. Stratified random sampling was used to select 32 Ss from each of the three diagnostic groups of aggressive, hyperactive, and withdrawn. One S was deleted from the hyperactive group because of unforeseen difficulties during the course of the study. The three diagnostic groupings were based on psychiatric evaluations conducted by Intermediate Unit psychiatrists and used a composite derived from the American Psychiatric Association behavioral categories (DSM-II, 1968). Eight Ss from each diagnostic category were then randomly assigned to each of the four treatment conditions. The four treatment conditions were a physical-fitness (PF) group, a general-coordination (GC) group, a specific-coordination (SC) group, and a control (C) group. The PF group participated in structured activities which were designed to improve their physical condition and which included calisthenics, running, weight training, and low-organization games. The GC group engaged in activities designed to improve the child's ability to control and maneuver his body in any desired manner. Many of the activities used with this group were modifications of activities taken from the Bucks County Public Schools

Perceptual Motor Programs, published by the Bucks County Public School System in Doylestown, Pennsylvania. The SC-group children were taught the skills necessary for successful performance in selected games (e.g., badminton, basketball, bowling, handball, touch football, volleyball, and wrestling) and were allowed to strengthen these skills by participating in such games. The C-group children were involved in normal family summer activities but were available for testing at the same time as the experimental groups. The three physical education programs were administered daily (5 days a week) for 1 hour during both the morning and afternoon camp sessions. Pre- and posttest data were collected in 3 motoric areas (strength, endurance, and coordination) and in 15 behavioral areas (scales of the Devereux Elementary School Behavior Rating Scale and the Quay Behavior Problem Checklist). The 30 physical-performance test items had been used as individual tests in a prior replication of this study. However, it was felt that the reliability of these single-item tests was low, and therefore the three composite measures of strength, endurance, and coordination were developed. Each of the 30 items were assigned to one of these three composites on the basis of a factor-analytic study in 1970 (Mann et al., 1973). The three composite tests and their individual items are presented in Table 1.

Insert Table 1 about here

RESULTS AND DISCUSSION

A two-way analysis of covariance (ANCOVA) was used for each of the three motoric tests. The factors were treatments and diagnostic groups. An ANCOVA analysis was also used for each of the 15 behavior scales (Devereux and Quay Scales). In all of the ANCOVA analyses reported here, the pretest served as the covariate. In the analyses involving the behavior scales, the diagnostic-

group factor was deleted, and one-way ANCOVA analyses were performed to examine differences among posttest treatment means after controlling for pretreatment differences. A summary of the various ANCOVA analyses is presented for the physical-performance tests in Table 2 and for the behavioral scales in Table 3.

Insert Tables 2 and 3 about here

The findings for the physical performance variables are consistent with those of previous studies. For the 10-item strength composite, the two main effects of treatments and diagnostic groups were significant ($p<.01$), while the interaction was not. The treatment means revealed that the SC group was superior to the PF group, which was, in turn, superior to the GC group. All three experimental groups had mean scores higher than those of the C group. On the second composite (endurance), a similar pattern of results was found. The ordering of treatment means was GC, SC, and PF. Once again the treatment means were superior to those of the C group. For the third composite (coordination), the treatments factor was not significant. For the diagnostic category on each of the three composites, the aggressive children showed the highest scores, followed in order by the hyperactive and withdrawn groups.

Thus, it appears that the two structured coordination techniques were superior to a general-fitness program in the three areas measured. All three programs were superior to the control-group activities (a normal summer of family activities). These conclusions held regardless of the diagnostic classification. Across all physical education programming techniques, the aggressive children benefited most, followed by the hyperactive and withdrawn children.

The findings regarding the benefit of physical education programming in

fostering better behavioral adjustments were disappointing. No significant differences were found using the scales of the Quay Behavior Problem Checklist. On the Devereux Elementary School Behavior Rating Scale, only 2 factors out of the 11 yielded significant ($p < .05$) treatment differences. Thus, for the behavioral measures involved, the investigators found little evidence for any strong effects of physical education programs on reducing subsequent behavior problems or fostering better school adjustment.

Several psychometric problems may have contributed to the lack of significant differences among the behavioral measures. First, the reliability of the scores on the single scales was very low. However, there was no meaningful way to combine the various scales into a single composite measure owing to the diverse nature of the behaviors measured. Another point to consider is that high scores on most of the scales do not necessarily mean more desirable adjustment.

The present study yielded evidence that physical education activities are important in developing the overall physical condition of emotionally disturbed children. Furthermore, results indicated that structured programs in the areas of general and specific coordination may be of value to children suffering from various emotional impairments. Finally, no evidence was found that improved behavioral adjustment (reduced problem behaviors) resulted from various physical education programming techniques.

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FOOTNOTES

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TABLE 1

ITEMS IN PHYSICAL PERFORMANCE COMPOSITES

Strength	Endurance	Coordination
throw and catch	flexed arm hang	kinesthesiometer
left grip	pull up	ball throw
right grip	push up	shot put
lung capacity	arm strength	volleyball serve
modified Harvard step test	tapered balance beam	volleyball volley
cable jump (5)	300-yard dash	curl up
extent flexibility	standing broad jump	zigzag run
cable jump (10)	30-yard dash	ball kick
back lift	dynamic flexibility	
leg lift	shuttle run	
	balance - A test	
	600-yard run	

TABLE 2

F VALUES FOR ANCOVA ANALYSES ON PHYSICAL PERFORMANCE

Physical Performance Composite	Effects		
	Treatments	Diagnostic Category	Interaction (T × DC)
Strength	9.161 **	4.913 **	1.450
Endurance	6.553 **	1.821 *	1.002
Coordination	2.32,	4.021 *	0.179

* $p < .05$.
** $p < .01$.

TABLE 3

F VALUES FOR ANCOVA ANALYSES ON BEHAVIORAL SCALES

Scale	Treatment Effect
Devereux Elementary School Behavior Rating Scale	
Classroom Disturbance	0.366
Impatience	2.842 *
Disrespect-Defiance	2.372
External Blame	0.906
Achievement Anxiety	3.043 *
External Reliance	1.824
Comprehension	1.793
Inattentive Withdrawn	1.634
Irrelevant-Responsiveness	1.779
Creative Initiative	2.62
Need for Closeness to the Teacher	0.427
Quay Behavior Problem Checklist	
Conduct	0.230
Personality	1.064
Immaturity	1.806
Socialized Delinquency	0.422

* $p < .05$.